

1. (Currently Amended) A high pressure fluid fitting assembly for a fluid-tight coupling of a tube member, having a conduit, to a connector member having a receiving port defined by an interior sealing wall and a bottom end wall, and formed for sliding receipt ~~of the distal end of said tube member therein~~ until a distal end thereof seats against said bottom end wall, said connector member further defining a passage extending therethrough and terminating in the receiving port, said fitting assembly comprising:

a RAM device having proximal surface and an opposite distal surface facing toward said connector member, and having an interior alignment wall defining an alignment passage extending from the proximal face to the distal face for sliding receipt of the tube member therethrough; and

a ferrule device having a proximal tube engaging portion, an opposite distal sealing portion and a tube receiving passage extending from the tube engaging portion to the sealing portion and formed for receipt of the tube member therethrough, said tube engaging portion being formed and dimensioned to contact the RAM device alignment wall and said sealing portion being formed and dimensioned to contact the connector member sealing wall such that when a compression force is increasingly applied to the RAM device in the direction toward the connector member, the RAM device alignment wall contacts the ferrule device tube engaging portion in manner causing an interior gripping surface thereof to increasingly radially gripping the tube member for movement of the ferrule device and the RAM device, as a unit, toward the connector member to increasingly urge the ferrule device sealing portion into fluid sealing engagement with the connector member sealing wall and to fluidly couple the tube member conduit to the connector member passage, and increasingly urge said distal end of the tube member into seated engagement with the bottom end wall of the connector member.

2. (Original) The fluid fitting assembly as defined by claim 1, further including:  
a spanner nut defining an access port for receipt of said tube member therethrough, adapted to engage said RAM device to exert said compression force.

3. (Currently Amended) . The fluid fitting assembly as defined by claim 2, wherein

the sealing portion of the ferrule device includes a sealing surface tapering inwardly toward the distal end thereof, and formed to increase the contact area with the connector member sealing wall as the compression force is increasingly applied.

4. (Original) The fluid fitting assembly as defined by claim 3, wherein  
said tube receiving passage of the ferrule device is defined by a substantially cylindrical interior wall, and said ferrule device further including:

a retention collar extending inwardly from said interior wall, and positioned proximate to the distal end of said sealing portion.

5. (Currently Amended) The fluid fitting assembly as defined by claim 2, wherein

~~said tube engaging portion of the ferrule device includes an~~ said interior gripping surface defining at least a portion of the tube receiving passage proximate the tube engaging portion, and said interior gripping surface increasingly circumferentially gripping said tube member as the compression force is increasingly applied.

6. (Original) The fluid fitting assembly as defined by claim 5, wherein  
the interior alignment wall of the RAM device includes a contacting wall tapering inwardly in a direction toward the proximal surface, and  
said tube engaging portion of the ferrule device includes a proximal contacting rim adapted to contact the inwardly tapered contacting wall of the RAM device in a manner causing the interior gripping surface of the ferrule device tube receiving passage to increasingly radially engage the tube member.
7. (Original) The fluid fitting assembly as defined by claim 6, wherein  
said interior alignment wall of the RAM device further includes a substantially cylindrical support wall extending in a direction distally from the contacting wall and terminating at the distal surface thereof to define a ferrule receiving recess, and  
said tube engaging portion of the ferrule device further includes a substantially cylindrical alignment surface extending distally from the contacting rim, and formed and dimensioned for sliding engagement with the substantially cylindrical support wall of the RAM device.
8. (Original) The fluid fitting assembly as defined by claim 6, wherein  
the proximal end of the ferrule device tube engaging portion tapers inwardly to define the contacting rim.
9. (Original) The fluid fitting assembly as defined by claim 1 8, wherein  
said engaging portion includes at least one longitudinally extending slot to facilitate engagement with said tube member.

10. (Original) The fluid fitting assembly as defined by claim 8, wherein

said ferrule device includes a distal shoulder portion adapted to contact a proximal face of the connector member to limit insertion of the ferrule device sealing portion into the connector member receiving port, and a proximal shoulder portion adapted to contact the distal surface of the RAM device to limit insertion of the tube engaging portion of the ferrule device into the RAM device alignment passage.

11. (Currently Amended) A high pressure fluid fitting assembly for a fluid-tight coupling of a plurality of tube members, each having a conduit, to a connector member as a unit, said connector member having a plurality of receiving ports each defined by an interior sealing wall and a bottom end wall, and each formed for sliding receipt of ~~a distal end of~~ a corresponding tube member ~~therein~~ until a distal end thereof seats against the respective bottom end wall, said connector member further defining a plurality of passages each extending therethrough and terminating in a corresponding receiving port, said fitting assembly comprising:

a RAM device ~~a~~ having proximal surface and an opposite distal surface facing toward said connector member, and having a plurality of alignment passages each defined by an alignment ~~passage~~ wall extending from the proximal face to the distal face for sliding receipt of a respective tube member therethrough; and

a plurality of ferrule devices each having a proximal tube engaging portion, an opposite distal sealing portion and a tube receiving passage extending from the tube engaging portion to the sealing portion and formed for receipt of a respective tube member therethrough, each said tube engaging portion being formed and dimensioned to contact a respective alignment wall of the RAM device and each said sealing portion of the ferrule device being formed and dimensioned to contact a respective sealing wall of the connector member such that when a compression force

is increasingly applied to the RAM device in the direction toward the connector member, the respective alignment walls of the RAM device contact the tube engaging portions of the ferrule devices in a manner causing a respective interior gripping surface thereof to increasingly radially gripping the corresponding tube members for movement of the ferrule devices and the RAM device, as a unit, toward the connector member to increasingly urge the ferrule device sealing portions into fluid sealing engagement with the connector member sealing wall and to fluidly couple the tube member conduits to the corresponding connector member passages, and increasingly urge said distal ends of the tube members into seated engagement with the respective bottom end walls of the connector member.

12. (Original) The fluid fitting assembly as defined by claim 1, further including:  
a spanner nut defining an access port for receipt of said tube members therethrough, and adapted to engage said RAM device to exert said compression force.

13. (Currently Amended) The fluid fitting assembly as defined by claim 11, wherein

the sealing portions of each ferrule device include a sealing surface tapering inwardly toward the distal end thereof, and formed to increase the contact area with the respective sealing wall of the connector member as the compression force is increasingly applied.

14. (Original) The fluid fitting assembly as defined by claim 13, wherein  
each sealing portion of the ferrule device is conical-shaped.

15. (Original) The fluid fitting assembly as defined by claim 14, wherein
- each ferrule device includes a distal shoulder portion adapted to contact a proximal face of the connector member to limit insertion of the ferrule device sealing portion into the connector member receiving port.
16. (Original) The fluid fitting assembly as defined by claim 15, wherein
- each distal shoulder portion extends circumferentially around the respective ferrule device.
17. (Currently Amended) The fluid fitting assembly as defined by claim 11, wherein
- ~~each tube engaging portion of the respective ferrule device includes an~~ said interior gripping surface defining at least a portion of the tube receiving passage proximate the tube engaging portion, and said interior gripping surface increasingly circumferentially gripping the respective tube member as the compression force is increasingly applied.
18. (Original) The fluid fitting assembly as defined by claim 17, wherein
- each interior alignment wall of the RAM device includes a contacting wall tapering inwardly in a direction toward the proximal surface, and
- each tube engaging portion of the respective ferrule device includes a proximal contacting rim adapted to contact the inwardly tapered contacting wall of the RAM device in a manner causing the interior gripping surface of the respective tube receiving passage of the ferrule device to increasingly radially engage the tube member.

19. (Original) The fluid fitting assembly as defined by claim 18, wherein

each interior alignment wall of the RAM device further includes a substantially cylindrical support wall extending in a direction distally from the contacting wall and terminating at the distal surface thereof to define a ferrule receiving recess, and

each tube engaging portion of the ferrule device further includes a substantially cylindrical alignment surface extending distally from the contacting rim, and formed and dimensioned for sliding engagement with the respective substantially cylindrical support wall of the RAM device.

20. (Original) The fluid fitting assembly as defined by claim 19, wherein

the proximal end of the each ferrule device tube engaging portion tapers inwardly to define the contacting rim.

21. (Currently Amended) The fluid fitting assembly as defined by claim 20, wherein

the inwardly taper of the each contacting rim is curvilinear in profile.

22. (Original) The fluid fitting assembly as defined by claim 19, wherein

each said ferrule device includes a proximal shoulder portion adapted to contact the distal surface of the RAM device to limit insertion of the tube engaging portion of the ferrule device into the respective RAM device receiving recess.

23. (Original) The fluid fitting assembly as defined by claim 13, wherein

each tube receiving passage of the respective ferrule device is defined by a substantially cylindrical interior wall, and each ferrule device further including:

a retention collar extending inwardly from said interior wall, and positioned proximate to the distal end of the respective sealing portion.

24. (Original) The fluid fitting assembly as defined by claim 17, wherein each said engaging portion of the ferrule device includes at least one longitudinally extending slot to facilitate engagement with the respective tube member.

25. (Original) The fluid fitting assembly as defined by claim 12, wherein an annular under-shoulder of the spanner nut slideably contacts an annular contact shoulder of RAM device to exert said compression force.

26. (Original) The fluid fitting assembly as defined by claim 25, wherein a central ferrule receiving recess positioned proximate a center of said RAM device is off-set a predetermined distance closer to the connector member relative the surrounding receiving recesses.

27. (Original) The fluid fitting assembly as defined by claim 26, wherein said predetermined distance is in the range of about 0.004 inch to about 0.006 inch.



28. (Currently Amended) A high pressure fluid connection system comprising:

a plurality of tube members each having a fluid conduit extending therethrough and terminating at respective distal ends thereof,

a fluid distribution device having a housing formed to seat a connection member having a plurality of receiving ports each defined by an interior sealing wall and a bottom end wall, and each formed for sliding receipt of ~~a distal end of a~~ corresponding tube member ~~therein~~ until a distal end thereof seats against the respective bottom end wall, said connector member further defining a plurality of passages each extending therethrough and terminating in a corresponding receiving port;

a RAM device having proximal surface and an opposite distal surface facing toward said connector member, and having a plurality of alignment passages each defined by an alignment passage extending from the proximal face to the distal face for sliding receipt of a respective tube member therethrough; and

a plurality of ferrule devices each having a proximal tube engaging portion, an opposite distal sealing portion and a tube receiving passage extending from the tube engaging portion to the sealing portion and formed for receipt of a respective tube member therethrough, each said tube engaging portion being formed and dimensioned to contact a respective alignment wall of the RAM device and each said sealing portion of the ferrule device being formed and dimensioned to contact a respective sealing wall of the connector member; and

a spanner nut defining an access port for receipt of said tube members therethrough, and adapted cooperate with the housing of the fluid distribution device to increasingly exert a compression force on said RAM device such that the respective alignment walls of the RAM device contact the tube engaging portions of the ferrule devices in a manner causing a respective interior gripping surface thereof

to increasingly radially gripping the corresponding tube members for movement of the ferrule devices and the RAM device, as a unit, toward the connector member to increasingly urge the ferrule device sealing portions into fluid sealing engagement with the connector member sealing wall and to fluidly couple the tube member conduits to the corresponding connector member passages, and increasingly urge said distal ends of the tube members into seated engagement with the respective bottom end walls of the connector member.

29. (Currently Amended) The fluid fitting assembly as defined by claim 28, wherein

the sealing portions of each ferrule device include a sealing surface tapering inwardly toward the distal end thereof, and formed to increase the contact area with the respective sealing wall of the connector member as the compression force is increasingly applied.

30. (Currently Amended) The fluid fitting assembly as defined by claim 28, wherein

~~each tube engaging portion of the respective ferrule device includes an~~ said interior gripping surface defining at least a portion of the tube receiving passage proximate the tube engaging portion, and said interior gripping surface increasingly circumferentially gripping the respective tube member as the compression force is increasingly applied.

31. (Original) The fluid fitting assembly as defined by claim 30, wherein

each interior alignment wall of the RAM device includes a contacting wall tapering inwardly in a direction toward the proximal surface, and

each tube engaging portion of the respective ferrule device includes a proximal contacting rim adapted to contact the inwardly tapered contacting wall of the RAM device in a manner causing the interior gripping surface of the respective tube receiving passage of the ferrule device to increasingly radially engage the tube member.

32. (Original) The fluid fitting assembly as defined by claim 31, wherein

each interior alignment wall of the RAM device further includes a substantially cylindrical support wall extending in a direction distally from the contacting wall and terminating at the distal surface thereof to define a ferrule receiving recess, and

each tube engaging portion of the ferrule device further includes a substantially cylindrical alignment surface extending distally from the contacting rim, and formed and dimensioned for sliding engagement with the respective substantially cylindrical support wall of the RAM device.

33. (Original) The fluid fitting assembly as defined by claim 30, wherein

each tube receiving passage of the respective ferrule device is defined by a substantially cylindrical interior wall, and each ferrule device further including:

a retention collar extending inwardly from said interior wall, and positioned proximate to the distal end of the respective sealing portion.

34. (Original) The fluid fitting assembly as defined by claim 33, wherein

each said engaging portion of the ferrule device includes at least one longitudinally extending slot to facilitate engagement with the respective tube member.

35. (Original) The fluid fitting assembly as defined by claim 28, wherein  
an annular under-shoulder of the spanner nut slideably contacts an annular  
contact shoulder of RAM device to exert said compression force.

36. (Original) The fluid fitting assembly as defined by claim 35, wherein  
a central ferrule receiving recess positioned proximate a center of said RAM  
device is off-set a predetermined distance closer to the connector member relative the  
surrounding receiving recesses.

Please add new claims 37-55 as follows:

37. (New) A fluid fitting assembly for a fluid-tight coupling of a tube member,  
having a conduit, to a connector member having a receiving port defined by an  
interior sealing wall and formed for sliding receipt of the distal end of said tube  
member therein, said connector member further defining a passage extending  
therethrough and terminating in the receiving port, said fitting assembly comprising:

a RAM device having proximal surface and an opposite distal surface facing  
toward said connector member, and having an interior alignment wall defining an  
alignment passage extending from the proximal face to the distal face for sliding  
receipt of the tube member therethrough, and including a contacting wall tapering  
inwardly in a direction toward the proximal surface; and

a ferrule device having a proximal tube engaging portion, an opposite distal  
sealing portion and a tube receiving passage extending from the tube engaging  
portion to the sealing portion and formed for receipt of the tube member therethrough,  
said tube engaging portion including a proximal contacting rim adapted to contact the

inwardly tapered contacting wall of the RAM device and an interior gripping surface defining at least a portion of the tube receiving passage, and said sealing portion being formed and dimensioned to contact the connector member sealing wall such that when a compression force is increasingly applied to the RAM device in the direction toward the connector member, the RAM device alignment wall contacts the ferrule device tube engaging portion in manner increasingly causing the interior gripping surface to radially grip the tube member for movement of the ferrule device and the RAM device, as a unit, toward the connector member to increasingly urge the ferrule device sealing portion into fluid sealing engagement with the connector member sealing wall and to fluidly couple the tube member conduit to the connector member passage.

38. (New) The fluid fitting assembly as defined by claim 37, wherein  
said tube receiving passage of the ferrule device is defined by a substantially cylindrical interior wall, and said ferrule device further including:  
a retention collar extending inwardly from said interior wall, and positioned proximate to the distal end of said sealing portion.

39. (New) The fluid fitting assembly as defined by claim 37, wherein  
said engaging portion includes at least one longitudinally extending slot to facilitate engagement with said tube member.

40. (New) A fluid fitting assembly for a fluid-tight coupling of a plurality of tube members, each having a conduit, to a connector member as a unit, said connector member having a plurality of receiving ports each defined by an interior sealing wall and formed for sliding receipt of a distal end of a corresponding tube member therein,

said connector member further defining a plurality of passages each extending therethrough and terminating in a corresponding receiving port, said fitting assembly comprising:

a RAM device having proximal surface and an opposite distal surface facing toward said connector member, and having a plurality of alignment passages each defined by a respective alignment wall extending from the proximal face to the distal face for sliding receipt of a respective tube member therethrough, each said alignment walls includes a respective contacting wall tapering inwardly in a direction toward the proximal surface; and

a plurality of ferrule devices each having a proximal tube engaging portion, an opposite distal sealing portion and a tube receiving passage extending from the tube engaging portion to the sealing portion and formed for receipt of a respective tube member therethrough, each said tube engaging portion including a respective proximal contacting rim adapted to contact the corresponding inwardly tapered contacting wall of the RAM device and an interior gripping surface defining at least a portion of the respective tube receiving passage, and each said sealing portion of the ferrule device being formed and dimensioned to contact a respective sealing wall of the connector member such that when a compression force is increasingly applied to the RAM device in the direction toward the connector member, the respective alignment walls of the RAM device contact the tube engaging portions of the ferrule devices in a manner increasingly radially gripping the corresponding tube members for movement of the ferrule devices and the RAM device, as a unit, toward the connector member to increasingly urge the ferrule device sealing portions into fluid sealing engagement with the connector member sealing wall and to fluidly couple the tube member conduits to the corresponding connector member passages.

41. (New) The fluid fitting assembly as defined by claim 40, further including:  
a spanner nut defining an access port for receipt of said tube members therethrough, and adapted to engage said RAM device to exert said compression force.
42. (New) The fluid fitting assembly as defined by claim 40, wherein  
each ferrule device includes a distal shoulder portion adapted to contact a proximal face of the connector member to limit insertion of the ferrule device sealing portion into the connector member receiving port.
43. (New) The fluid fitting assembly as defined by claim 40, wherein  
the proximal end of the each ferrule device tube engaging portion tapers inwardly to define the contacting rim.
44. (New) The fluid fitting assembly as defined by claim 40, wherein  
each said ferrule device includes a proximal shoulder portion adapted to contact the distal surface of the RAM device to limit insertion of the tube engaging portion of the ferrule device into the respective RAM device receiving recess.
45. (New) The fluid fitting assembly as defined by claim 40, wherein  
each said engaging portion of the ferrule device includes at least one longitudinally extending slot to facilitate engagement with the respective tube member.

46. (New) A fluid fitting assembly for a fluid-tight coupling of a plurality of tube members, each having a conduit, to a connector member as a unit, said connector member having a plurality of receiving ports each defined by an interior sealing wall and formed for sliding receipt of a distal end of a corresponding tube member therein, said connector member further defining a plurality of passages each extending therethrough and terminating in a corresponding receiving port, said fitting assembly comprising:

a RAM device a having proximal surface and an opposite distal surface facing toward said connector member, and having a plurality of alignment passages each defined by an alignment passage extending from the proximal face to the distal face for sliding receipt of a respective tube member therethrough; and

a plurality of ferrule devices each having a proximal tube engaging portion, an opposite distal sealing portion and a tube receiving passage extending from the tube engaging portion to the sealing portion and formed for receipt of a respective tube member therethrough, each said tube engaging portion being formed and dimensioned to contact a respective alignment wall of the RAM device, and each including a respective interior gripping surface defining at least a portion of the respective tube receiving passage and at least one longitudinally extending slot to facilitate engagement with the respective tube member, and each said sealing portion of the ferrule device being formed and dimensioned to contact a respective sealing wall of the connector member such that when a compression force is increasingly applied to the RAM device in the direction toward the connector member, the respective alignment walls of the RAM device contact the tube engaging portions of the ferrule devices in a manner increasingly radially gripping the corresponding tube members for movement of the ferrule devices and the RAM device, as a unit, toward the connector member to increasingly urge the ferrule device sealing portions into



fluid sealing engagement with the connector member sealing wall and to fluidly couple the tube member conduits to the corresponding connector member passages.

47. (New) The fluid fitting assembly as defined by claim 46, wherein

each ferrule device includes a distal shoulder portion adapted to contact a proximal face of the connector member to limit insertion of the ferrule device sealing portion into the connector member receiving port.

48. (New) The fluid fitting assembly as defined by claim 46, wherein

each interior alignment wall of the RAM device includes a contacting wall tapering inwardly in a direction toward the proximal surface, and

each tube engaging portion of the respective ferrule device includes a proximal contacting rim adapted to contact the inwardly tapered contacting wall of the RAM device in a manner causing the interior gripping surface of the respective tube receiving passage of the ferrule device to increasingly radially engage the tube member.

49. (New) A fluid fitting assembly for a fluid-tight coupling of a plurality of tube members, each having a conduit, to a connector member as a unit, said connector member having a plurality of receiving ports each defined by an interior sealing wall and formed for sliding receipt of a distal end of a corresponding tube member therein, said connector member further defining a plurality of passages each extending therethrough and terminating in a corresponding receiving port, said fitting assembly comprising:

a RAM device a having proximal surface and an opposite distal surface facing toward said connector member, and having a plurality of alignment passages each

defined by an alignment passage extending from the proximal face to the distal face for sliding receipt of a respective tube member therethrough;

a spanner nut defining an access port for receipt of said tube members therethrough, and including an annular under-shoulder of the spanner nut adapted slideably engage an annular contact shoulder of RAM device to exert a compression force thereon in the direction toward the connector member; and

a plurality of ferrule devices each having a proximal tube engaging portion, an opposite distal sealing portion and a tube receiving passage extending from the tube engaging portion to the sealing portion and formed for receipt of a respective tube member therethrough, each said tube engaging portion being formed and dimensioned to contact a respective alignment wall of the RAM device and each said sealing portion of the ferrule device being formed and dimensioned to contact a respective sealing wall of the connector member such that when said compression force is increasingly applied to the RAM device, the respective alignment walls of the RAM device contact the tube engaging portions of the ferrule devices in a manner increasingly radially gripping the corresponding tube members for movement of the ferrule devices and the RAM device, as a unit, toward the connector member to increasingly urge the ferrule device sealing portions into fluid sealing engagement with the connector member sealing wall and to fluidly couple the tube member conduits to the corresponding connector member passages, and a central ferrule receiving recess positioned proximate a center of said RAM device is off-set a predetermined distance closer to the connector member relative the surrounding receiving recesses.

50. (New) The fluid fitting assembly as defined by claim 49, wherein

said predetermined distance is in the range of about 0.004 inch to about 0.006 inch.

51. (New) The fluid fitting assembly as defined by claim 49, wherein

each tube engaging portion of the respective ferrule device includes an interior gripping surface defining at least a portion of the tube receiving passage proximate the tube engaging portion, said interior gripping surface increasingly circumferentially gripping the respective tube member as the compression force is increasingly applied.

52. (New) The fluid fitting assembly as defined by claim 51, wherein

each said engaging portion of the ferrule device includes at least one longitudinally extending slot to facilitate engagement with the respective tube member.

53. (New) A fluid connection system comprising:

a plurality to tube member each having a fluid conduit extending therethrough and terminating at respective distal ends thereof,

a fluid distribution device having a housing formed to seat a connection member having a plurality of receiving ports each defined by an interior sealing wall and formed for sliding receipt of a distal end of a corresponding tube member therein, said connector member further defining a plurality of passages each extending therethrough and terminating in a corresponding receiving port;

a RAM device having proximal surface and an opposite distal surface facing toward said connector member, and having a plurality of alignment passages each

defined by an alignment passage extending from the proximal face to the distal face for sliding receipt of a respective tube member therethrough; and

a plurality of ferrule devices each having a proximal tube engaging portion, an opposite distal sealing portion and a tube receiving passage extending from the tube engaging portion to the sealing portion and formed for receipt of a respective tube member therethrough, each tube engaging portion includes an interior gripping surface defining at least a portion of the tube receiving passage proximate the tube engaging portion, and each said tube engaging portion being formed and dimensioned to contact a respective alignment wall of the RAM device, each said sealing portion of the ferrule device being formed and dimensioned to contact a respective sealing wall of the connector member; and

a spanner nut defining an access port for receipt of said tube members therethrough, and adapted cooperate with the housing of the fluid distribution device to increasingly exert a compression force on said RAM device such that the respective alignment walls of the RAM device contact the tube engaging portions of the ferrule devices in a manner increasingly radially gripping the corresponding tube members for movement of the ferrule devices and the RAM device, as a unit, toward the connector member to increasingly urge the ferrule device sealing portions into fluid sealing engagement with the connector member sealing wall and to fluidly couple the tube member conduits to the corresponding connector member passages.

54. (New) The fluid fitting assembly as defined by claim 53, wherein

the sealing portions of each ferrule device include a sealing surface tapering inwardly toward the distal end thereof, and formed to increase the contact area with the respective sealing wall of the connector member as the compression force is increasingly applied.